



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,800	06/14/2006	Naoyuki Yada	103203-00014	6995
4372	7590	07/12/2010	EXAMINER	
ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			TAI, XIUYU	
			ART UNIT	PAPER NUMBER
			1795	
			NOTIFICATION DATE	DELIVERY MODE
			07/12/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com
IPMatters@arentfox.com
Patent_Mail@arentfox.com

Office Action Summary	Application No. 10/582,800	Applicant(s) YADA, NAOYUKI	
	Examiner Xiuyu Tai	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Due to applicant amendment, objection to abstract and to claim 15 are withdrawn.
2. Applicant's arguments with respect to claims 9, 13-21 have been considered but are moot in view of the new ground(s) of rejection necessitated by applicant's amendment.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 9, 13-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 9 recites limitation of "a first/second pressure-proof structural plate member". The instant specification does not provide clear definition regarding "a pressure-proof structural plate member" and it is not a conventional term in the art. Therefore, appropriate clarification is required. For the purpose of examination, "a pressure-proof structural plate member" is interpreted as a structure that would not result in big back pressure, such as a plate having a plurality of openings.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1795

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 9, and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konold (PG-PUB US 2002/0121298) in view of Peck (U.S. 4,021,816) and Bakke (U.S. 2003/0136551), and further in view of Takeuchi et al (U.S. 4,566,431).

9. Regarding claim 9, Konold discloses an apparatus for converting solar energy to thermal and electrical energy. The apparatus includes:

(1) a photovoltaic unit/grid 101 (i.e. a solar battery panel, Figures 1 & 2, paragraphs [0014], [0039] & [0040]);

(2) a heat transfer unit 102 mounted below the photovoltaic grid 101 (i.e. a heat pipe affixed to a back surface of the solar battery panel, Figure 1, 2, & 4, paragraphs [0014] & [0034]), wherein the heat transfer unit 102 converts solar energy into thermal energy from a fluid by discharging heat (paragraph [0014] & [0044]); and

(3) a liquid storage tank 104 which may be provided as roof top storage tank for city water (i.e. a hot water generation part, Figures 1 , 6, & 8, paragraph [0045] &

Art Unit: 1795

[0047]), wherein the storage tank is fully capable of performing the claimed functions, such as obtaining water by storing water inside.

Konold teaches a heat transfer unit having tubing (paragraph [0029]), but does not teach the heat transfer unit having the claimed structure. However, Peck discloses a heat transfer device (ABSTRACT). The heat transfer device of a heat pipe comprises: (i) a thin metal base 51 (i.e. a first metal plate, Figure 9, col. 9, line 31-32); (ii) a plated layer 58 having a plurality opening 57 (i.e. a first pressure-proof structural plate member, Figure 9, col. 9, line 48-500; (iii) a plurality of capillary channels of wick 56 (i.e. a plate wick, Figure 9, col. 9, line 39-40); (iv) a space created by a bushing 53 (i.e. a cavity, Figure 9, col. 9, line 3—34); and (v) a thin metal top 52 (i.e. a second metal plate, Figure 9, col. 9, line 32). Peck also suggests an integral screen wick on the top of the capillary channel wick as shown in Figure1 (col. 4, line 21-29), resulting in a second screen surface 17 (i.e. a second pressure-proof structural plate member) on the capillary wick channels 56.

Peck teaches thin copper top/base plate (col. 8, line 1-4), but does not specifically teach the thin top/base plate as being a foil. However, Bakke discloses a heat pipe as a heat transfer unit and copper foil can be used in a heat pipe (paragraph [0034]). The teaching of Bakke shows that a copper foil as heat input/output surface in a heat pipe and is an equivalent structure to copper plate as heat input/output surface in a heat pipe. Therefore, one having ordinary skill in the art would have found it obvious to substitute copper foil for copper plate because they are art-recognized equivalent.

Art Unit: 1795

Konold/Peck/Bakke does not teach one side of the heat pipe immersed in the water. However, Takeuchi et al a solar heat collector (ABSTRACT), A solar heat collecting tube 7 is positioned within a water reservoir 1 (Figure1, col. 2, line 8-10) and such configuration can achieve effective heat exchange (col. 2, line 59-61). Therefore, it would be obvious for one having ordinary skill in the art to immerse one end of the heat pipe of Konold/Peck/Bakke in the water tank as suggested by Takeuchi in order to improve heat exchange.

10. Regarding claim 13, Konold teaches that the heat transfer unit is bonded to the panel using a thermal conducting compound [i.e. a heat conductive adhesive, paragraphs [0014] & [0034]].

11. Regarding claim 14, Konold teaches a copper plate 403 is mated between the photovoltaic grid 401 and the heat exchanger unit 404 (Figure 4, paragraphs [0029] & [0034]).

12. Regarding claim 15, Konold teaches a copper plate 403 is mated between the photovoltaic grid 401 and the heat exchanger unit 404 (Figure 4, paragraphs [0029] & [0034]). Peck teaches that a plurality of heat pipes 102 A-D are arranged as an array along a heat source surface 101, which may be divided into a plurality of regions (Figure 18, col. 12, line 1-5), As shown in Figure 18, the total area that is covered by all heat pipes 102 (i.e. a fixed area of the heat pipes) is smaller than the total area of the heat source surface 101 (i.e. area of the fields, Figure 18).

13. Regarding claim 16, Konold teaches that the copper plate and the heat exchanger unit are bonded by using thermal conducting compound (paragraph [0034]).

Art Unit: 1795

14. Regarding claim 17, Peck teaches a finned member 39 (i.e. a heat release accelerator) for better heat exchange (Figure 6, col. 8, line 55-57).

15. Regarding claim 18, Konold teaches a liquid storage tank 104 which may be provided as roof top storage tank for city water (i.e. Figures 1, 6, & 8, paragraph [0045] & [0047]).

16. Regarding claim 19, the liquid storage tank 104 of Konold may have a tank shape (Figure 1).

17. Regarding claim 20, the liquid storage tank 104 of Konold connects with the solar panel collector 100 via pipes (Figure 1).

18. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Konold (PG-PUB US 2002/0121298), Peck (U.S. 4,021,816), Bakke (U.S. 2003/0136551), and Takeuchi et al (U.S. 4,566,431), as applied to claim 20 above, and further in view of Nomiya (JP 20003-137199, cited in IDS)

19. Regarding claim 21, Konold/Peck/Bakke/Taneuchi does not teach the solar cell being installed along a slope. However, Nomiya discloses a solar battery panel having a sheet heat pipe underneath the solar panel to transfer heat (Drawing 1 & 2, paragraph [0012]). Drawing 2 of Nomiya shows that the solar battery panels 8b and 8c are installed on stair-like structure (i.e. an inclined/sloped structure) and the heat pipe is arranged along the solar panel 8b/8c on the inclined structure (drawing 2, paragraph [0020]). Nomiya indicates that the arrangement of solar panel on an inclined structure improves energy conversion efficiency (paragraph [0021]). Therefore, it would be obvious for one having ordinary skill in the art to arrange the solar panel in

Art Unit: 1795

an inclined structure as suggested by Nomiyama in order to improve energy conversion efficiency of Konold/ Peck/Bakke/Taneuchi.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855.

The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/X. T./
Examiner, Art Unit 1795.

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795